ISTEC-CNR

Agenzia Polo Ceramico

CERAMICS, CELLS AND TISSUES
12th Annual Seminar & Meeting

ABSTRACTS

Topic of this year:

SURFACE-REACTIVE BIOMATERIALS AS SCAFFOLDS AND COATINGS: INTERACTIONS WITH CELLS AND TISSUES

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Finceramica
Regenerative surgery

IBS
International Biomedical Systems

EXPOSANITA'
Senaf-Bologna

Tailored preparation of nano and micro composites as new controlled bone drug delivery systems

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Method of homogenous sono-chemical precipitation for obtaining controlled forms of micro/nano particles of desired shapes, size and distribution, and solvent/non-solvent method for obtaining spherical particles of polymer or polymer/ceramics composites with the encapsulated pharmacologically active agent for the treatment of bone tissue pathology, are methods developed in our laboratory for the production of nano and micro ceramic/polymer or polymer composite systems which can be potentially used as controlled bone drug delivery system.

Method of homogenous sono-chemical precipitation, by designing synthesis parameters like temperature, frequency, energy and ultrasonic field regime, and by applying appropriate solvents, enables producing desired forms and particle structures. Through this method calcium phosphate systems can be obtained, but also systems where calcium phosphate particles are coated with bioresorbable polymer with immobilized antibiotic.

Physicochemical synthesis procedure in solvent/non-solvent method consists of initial dissolve of desired bioresorbable polymers and its homogenization, followed by encapsulation of the desired agents. Already produced pharmaceutically active compounds (ascorbic, folic acid, peroxidase, antibiotics, autologous plasma, etc.) can be encapsulated or different calcium phosphates used as fillers for the defected bone tissue.

Micro, submicro and nano sized particles in deagglomeration form, optimal for the advanced application in bone engineering, are obtained through these preparation methods.